DEPOSITIONAL RECORD AND SEDIMENTARY PROCESSES IN EXUMA VALLEY, THE BAHAMAS

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Exuma Valley (EV) is a giant, 130 km-long, submarine thalweg connecting the southern part of Exuma Sound (ES) to the San Salvador abyssal plain in the southeastern Bahamas. Shallow-water carbonate environments surrounding ES episodically provide sediments that are funneled in EV, which shows several sharp knickpoints, and a low sinuosity profile between 2,200 and 3,000 m deep. High-resolution multibeam imaging, very high resolution seismic (VHR) as well as sediment cores were obtained during the CARAMBAR2 cruise (2016-2017). These data allow for a detailed analysis of the depositional environments, their lateral extent as well as the nature of deposits that accumulated in the axis of EV. Five sediment cores, 3 to 6 m in length, were retrieved from the upper, middle, and lower part of the valley. The cores showed an alternation of coarse-grained deposits, interpreted as density flows, and periplatform ooze.

Two debrites (D1 and D2) occur at the base of KS26 and KS16. D1 is evidenced upstream in the upper part of EV and contains cohesive, polymict mud-clasts predominantly composed of carbonate mud as well as planktic input. An Early to Middle (?) Pleistocene age is concurred by the presence of *Globorotalia tosaensis* and *Globorotalia truncatulinoides*. D2 occurs in the middle part of the valley and contains coarse (up to 5 cm) coral debris (*cf Montastraea annularis* group and *cf Favia fragum*) attesting the shallow-water origin of the clasts within this debrite. The total thickness of D1 and D2 is unknown while the coring device did not fully penetrate the deposit, but low amplitude and contorted reflections present in the VHR seismic suggest that they likely are several meter-thick. Well-sorted, sandy turbidites occur in every core and form a significant part of the sedimentary succession in the axis of EV making up 27.0 to 62.5% of the deposits. Grain-size analyses reveal an increased proportion of clay-size particles in the turbidites in the upper and the lower part of the valley, respectively ca. 20 and 12% on average, while sand is predominant in proportions exceeding 84% in the middle part of EV.

Three specific processes govern sediment distribution along this deep-sea carbonate valley, namely: i) large-scale slope failures feeding the proximal parts of the system, i.e. in ES; ii) shedding of coarse shallow-water clasts through slope tributaries merging at high-angle with the main valley axis, and iii) sediment sorting processes documented by the enrichment in the percentage of sands in the deposits when moving from the upper to the middle valley. Although constraints of the timing of sediment shedding through EV still need to be studied in detail (work in progress), the sedimentary record of EV demonstrates its importance as a sediment transport thalweg connecting shallow-water realms to the submarine deep-water fans, it also is a sedimentary system that might have relevance in terms of reservoir potential of deep-water carbonate systems.